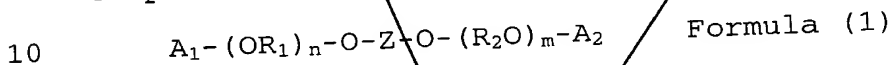


CLAIMS

1. A method for producing a liquid crystal optical element, which comprises sandwiching a mixture of a liquid crystal with an uncured curable compound between a pair of substrates which are provided with transparent electrodes and of which at least one is transparent, and curing the curable compound to form a liquid crystal/cured composite layer, wherein the curable compound contains a compound of the formula (1):



wherein each of  $A_1$  and  $A_2$  which are independent of each other, is an acryloyl group, a methacryloyl group, a glycidyl group or an allyl group; each of  $R_1$  and  $R_2$  which are independent of each other, is a  $C_{2-6}$  alkylene group;  $Z$  is a bivalent mesogen structure; and each of  $n$  and  $m$  which are independent of each other, is an integer of from 1 to 10.

2. The method for producing a liquid crystal optical element according to Claim 1, wherein  $Z$  is a 4,4'-biphenylene group, or a 4,4'-biphenylene group having part or all of hydrogen substituted by  $C_{1-2}$  alkyl or halogen atoms.

3. The method for producing a liquid crystal optical element according to Claim 1 or 2, wherein each of  $R_1$  and  $R_2$  which are independent of each other, is an ethylene group or a propylene group.

4. The method for producing a liquid crystal optical

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element according to Claim 1, 2 or 3, wherein each of A<sub>1</sub> and A<sub>2</sub> which are independent of each other, is an acryloyl group or a methacryloyl group.

5 The method for producing a liquid crystal optical element according to Claim 1, 2, 3 or 4, wherein each of n and m which are independent of each other, is from 1 to 4.

6 The method for producing a liquid crystal optical element, wherein the curable compound contains two types  
10 of curable compounds, of which the molecular weights are different by at least two times.

7 The method for producing a liquid crystal optical element according to Claim 6, wherein the curable  
compound contains a curable compound containing a mesogen  
15 structural portion in its molecule and a curable compound containing no mesogen structural portion.

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8 The method for producing a liquid crystal optical element according to Claim 6 or 7, wherein the two types  
of curable compounds have curable sites connectable to  
20 each other.

9 The method for producing a liquid crystal optical element according to Claim 6, 7 or 8, which contains a curable compound having a molecular weight of at least 1,000.

25 10 The method for producing a liquid crystal optical element according to any one of Claims 1 to 9, wherein the mixture contains a chiral agent.

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11. The method for producing a liquid crystal optical element according to any one of Claims 1 to 9, wherein the mixture contains a chiral agent, and the helical pitch of the chiral agent is at least 4  $\mu\text{m}$  and at most three times of the electrode gap.

12. The method for producing a liquid crystal optical element according to Claim 11, wherein the electrode gap is from 4 to 50  $\mu\text{m}$ .

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13. The method for producing a liquid crystal optical element according to Claim 11 or 12, wherein the helical pitch is at least 5  $\mu\text{m}$  and at most two times of the electrode gap.

14. The method for producing a liquid crystal optical element according to any one of Claims 1 to 13, wherein the mixture contains a very small amount of a curing catalyst.

15. The method for producing a liquid crystal optical element according to any one of Claims 1 to 14, wherein a plurality of compounds of the formula (1) wherein n and m are different, are used in combination.

16. A liquid crystal optical element produced by the method as defined in any one of Claims 1 to 15.

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